2014

Test 2101: John Deere 8320R

Nebraska Tractor Test Laboratory
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NEBRASKA OECD TRACTOR TEST 2101 - SUMMARY 966
JOHN DEERE 8320R DIESEL
16 SPEED

Chassis Serial numbers 90001 and higher

Location of tests: Nebraska Tractor Test Laboratory, University of Nebraska, Lincoln, Nebraska 68583-0832

Dates of tests: October 23 - 31, 2014

Manufacturer: John Deere Tractor Works, 3500 East Donald St., P.O. Box 270, Waterloo Ia, 50704-0270

POWER TAKE-OFF PERFORMANCE

Power HP *(kW)*	Crank shaft speed rpm	Diesel Consumption Gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	D.E.F. Consumption Hp.hr/gal *(kW.h/l)*	D.E.F. Consumption Gal/hr *(l/h)*	Mean Atmospheric Conditions
MAXIMUM POWER AND FUEL CONSUMPTION						
Rated Engine Speed—(PTO speed—1048 rpm)						
281.25 *(209.73)*	2099	14.84 *(56.17)*	0.371 *(0.226)*	18.96 *(3.73)*	0.32 *(1.19)*	Fuel used during active exhaust regeneration-0.85 gal *(3.22 l)* (see note 1, p.2)
Standard Power Take-off Speed(1000 rpm)						
307.69 *(229.44)*	2003	15.98 *(60.49)*	0.365 *(0.222)*	19.26 *(3.79)*	0.33 *(1.23)*	
Maximum Power (1 hour)						
318.08 *(237.19)*	1899	16.36 *(61.94)*	0.362 *(0.220)*	19.44 *(3.83)*	0.33 *(1.24)*	
VARYING POWER AND FUEL CONSUMPTION						
281.25 *(209.73)*	2099	14.84 *(56.17)*	0.371 *(0.226)*	18.96 *(3.73)*	0.32 *(1.19)*	Air temperature
245.50 *(183.07)*	2155	13.20 *(49.98)*	0.378 *(0.230)*	18.60 *(3.66)*	0.27 *(1.01)*	73°F *(23°C)*
184.98 *(137.94)*	2166	10.46 *(39.59)*	0.398 *(0.242)*	17.69 *(3.48)*	0.21 *(0.79)*	Relative humidity
123.97 *(92.44)*	2177	7.92 *(29.98)*	0.450 *(0.273)*	15.65 *(3.08)*	0.16 *(0.62)*	55%
62.19 *(46.38)*	2186	5.78 *(21.89)*	0.654 *(0.398)*	10.75 *(2.12)*	0.12 *(0.47)*	Barometer
3.76 *(2.81)*	2198	3.42 *(12.94)*	6.391 *(3.888)*	1.10 *(0.22)*	0.07 *(0.28)*	28.82" Hg *(97.60 kPa)*

Maximum Torque - 1019 lb.-ft. *(1381 Nm)* at 1599 rpm
Maximum Torque Rise - 44.8%
Torque rise at 1679 engine rpm - 40%
Power increase at 1899 rpm - 13.1%

DRAWBAR PERFORMANCE
UNBALLASTED - FRONT DRIVE ENGAGED
FUEL CONSUMPTION CHARACTERISTICS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Fuel Consumption Hp.hr/gal *(kW.h/l)*	D.E.F Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Power—8th Gear										
253.13 *(188.76)*	19848 *(88.29)*	4.78 *(7.69)*	2100	4.6	0.412 *(0.251)*	17.07 *(3.36)*	0.012 *(0.007)*	194 *(90)*	46 *(8)*	28.81 *(97.56)*
75% of Pull at Maximum Power—8th Gear										
198.04 *(147.67)*	14889 *(66.23)*	4.99 *(8.03)*	2160	3.3	0.431 *(0.262)*	16.31 *(3.21)*	0.011 *(0.007)*	190 *(88)*	54 *(12)*	28.85 *(97.70)*
50% of Pull at Maximum Power—8th Gear										
134.37 *(100.20)*	9945 *(44.24)*	5.07 *(8.16)*	2170	2.2	0.483 *(0.294)*	14.56 *(2.87)*	0.012 *(0.007)*	188 *(86)*	55 *(13)*	28.85 *(97.70)*
75% of Pull at Reduced Engine Speed—11th Gear										
197.78 *(147.48)*	14925 *(66.39)*	4.97 *(8.00)*	1391	3.2	0.389 *(0.237)*	18.07 *(3.56)*	0.011 *(0.007)*	207 *(97)*	54 *(12)*	28.85 *(97.70)*
50% of Pull at Reduced Engine Speed—11th Gear										
134.72 *(100.46)*	9932 *(44.18)*	5.09 *(8.19)*	1409	2.2	0.410 *(0.249)*	17.16 *(3.38)*	0.012 *(0.007)*	190 *(88)*	56 *(13)*	28.85 *(97.70)*

CONSUMABLE Fluids, OIL and TIME: Fuel No. 2 Diesel **Specific gravity converted to 60°/60°F *(15°/15°C)*** 0.8450 **Fuel weight** 7.036 lbs/gal *(0.843 kg/l)* **Diesel Exhaust Fluid (DEF)** 32% aqueous urea solution **DEF weight** 9.071 lbs/gal *(1. 087 kg/l)* **Oil SAE** 10W-30 **API service classification** CJ-4 **Transmission and hydraulic lubricant** John Deere Hy-Gard fluid **Front axle lubricant** John Deere Hy-Gard fluid **Total time engine was operated:** 22.0 hours

ENGINE: Make John Deere Diesel **Type** six cylinder vertical with two turbochargers and air to air aftercooler and D.E.F (diesel exhaust fluid) exhaust treatment **Serial No.***RG6090U002812* **Crankshaft** lengthwise **Rated engine speed** 2100 **Bore and stroke** 4.661" x 5.354" *(118.4 mm x 136.0 mm)* **Compression ratio** 16.0 to 1 **Displacement** 548 cu in *(8984 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements and aspirator **Oil filter** one full flow cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper element and water separator **Fuel cooler** radiator for pump return fuel **Exhaust** DOC (diesel oxidation catalyst), SCR (selective catalyst reduction) and regenerative DPF (diesel particulate filter) integrated within a vertical muffler **Cooling medium temperature control** thermostat and variable speed fan

ENGINE OPERATING PARAMETERS: Fuel rate: 101.3 - 109.7 lb/h *(45.9 - 49.8 kg/h)* **High idle:** 2190 - 2210 rpm **Turbo boost:** nominal 20.3 -23.2 psi *(140 - 160 kPa)* as measured 21.2 psi *(146 kPa)*

CHASSIS: Type front wheel assist with duals **Serial No.***1RW8320RCEP091033* **Tread width** rear 60.0" *(1524 mm)* to 132.6" *(3368 mm)* front 60.0" *(1524 mm)* to 88.0" *(2235 mm)* **Wheelbase** 121.3" *(3080 mm)* **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled power shift **Nominal travel speeds mph *(km/h)*** first 1.22 *(1.97)* second 1.63 *(2.63)* third 2.18 *(3.51)* fourth 2.92 *(4.70)* fifth 3.27 *(5.27)* sixth 3.77 *(6.07)* seventh 4.39 *(7.06)* eighth 5.06 *(8.14)* ninth 5.84 *(9.40)* tenth 6.73 *(10.83)* eleventh 7.82 *(12.58)* twelfth 9.02 *(14.51)* thirteenth 10.63 *(17.10)* fourteenth 14.23 *(22.90)* fifteenth 18.95 *(30.49)* sixteenth 25.38 *(40.85)* reverse 1.14 *(1.84)*, 3.06 *(4.93)*, 3.87 *(6.22)*, 7.10 *(11.42)*@1500 engine rpm

DRAWBAR PERFORMANCE

UNBALLASTED - FRONT DRIVE ENGAGED - 2100 RPM

DRAWBAR POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					5th Gear					
213.05 *(158.87)*	27922 *(124.20)*	2.87 *(4.61)*	2152	14.0	0.467 *(0.284)*	15.07 *(2.97)*	0.011 *(0.007)*	191 *(88)*	49 *(9)*	28.98 *(98.14)*
					6th Gear					
240.37 *(179.24)*	26727 *(118.89)*	3.38 *(5.43)*	2101	9.9	0.435 *(0.265)*	16.17 *(3.18)*	0.011 *(0.006)*	193 *(89)*	50 *(10)*	28.97 *(98.10)*
					7th Gear					
249.90 *(186.35)*	22920 *(101.95)*	4.09 *(6.58)*	2099	5.9	0.417 *(0.253)*	16.89 *(3.33)*	0.012 *(0.007)*	201 *(94)*	51 *(11)*	28.83 *(97.63)*
					8th Gear					
253.13 *(188.76)*	19848 *(88.29)*	4.78 *(7.69)*	2100	4.6	0.412 *(0.251)*	17.07 *(3.36)*	0.012 *(0.007)*	194 *(90)*	46 *(8)*	28.81 *(97.56)*
					9th Gear					
253.78 *(189.24)*	17071 *(75.94)*	5.57 *(8.96)*	2100	3.9	0.411 *(0.250)*	17.10 *(3.37)*	0.011 *(0.007)*	196 *(91)*	43 *(6)*	28.79 *(97.49)*
					10th Gear					
255.23 *(190.32)*	14823 *(65.93)*	6.46 *(10.39)*	2099	3.1	0.409 *(0.249)*	17.21 *(3.39)*	0.011 *(0.007)*	197 *(91)*	47 *(8)*	28.81 *(97.56)*
					11th Gear					
250.85 *(187.06)*	12476 *(55.49)*	7.54 *(12.13)*	2100	2.7	0.415 *(0.253)*	16.94 *(3.34)*	0.012 *(0.007)*	197 *(91)*	47 *(9)*	28.82 *(97.60)*
					12th Gear					
251.12 *(187.26)*	10794 *(48.01)*	8.73 *(14.04)*	2100	2.3	0.415 *(0.252)*	16.95 *(3.34)*	0.011 *(0.007)*	204 *(96)*	49 *(10)*	28.82 *(97.60)*

TRACTOR SOUND LEVEL WITH CAB	Front Wheel Drive Engaged dB(A)	Disengaged dB(A)
At no load in 8th gear	67.9	67.9
Transport speed - no load - 16th gear		70.6
Bystander in 16th gear		84.7

TIRES AND WEIGHT — **Tested Without Ballast**

Rear Tires - No., size, ply & psi*(kPa)*	Four 480/80R50;***;12*(85)*
Front Tires - No., size, ply & psi*(kPa)*	Two 420/85R34;***;26*(180)*
Height of Drawbar	21.0 in *(535 mm)*
Static Weight with operator - Rear	15940 lb *(7230 kg)*
- Front	11475 lb *(5205 kg)*
- Total	27415 lb*(12435 kg)*

Clutch wet multiple disc hydraulically actuated by foot pedal **Brakes** wet multiple disc hydraulically operated by two foot pedals that can be locked together **Steering** hydrostatic **Power take-off** 1000 rpm at 2004 engine rpm **Unladen tractor mass** 27240 lb *(12356 kg)*

REPAIRS AND ADJUSTMENTS: No repairs or adjustments.

NOTE 1: The manufacturer declares that the average time between active regenerations is 50 hours, while operated in Auto Filter Cleaning Mode, at rated speed, full load, under steady state conditions.

NOTE 2: The performance data on this report applies to tractors with chassis serial numbers that end with 90001 and higher.

REMARKS: All test results were determined from observed data obtained in accordance with official OECD, SAE and Nebraska test procedures. This tractor did not meet the manufacturer's remote hydraulic flow claim of 85 GPM *(321l/min)* with the dual pumps combined. For the maximum power tests the fuel temperature at the injection pump inlet was maintained at 100°F *(38°C)*. The performance figures on this summary were taken from a test conducted under the OECD Code 2 test procedure.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **2101,** Nebraska Summary 966, December 19, 2014.

Roger M. Hoy
Director

M.F. Kocher
J.D. Luck
P.J. Jasa
Board of Tractor Test Engineers

DRAWBAR PERFORMANCE
UNBALLASTED-FRONT DRIVE ENGAGED - 1900 RPM
MAXIMUM POWER IN SELECTED GEARS

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	D.E.F Consumption lb/hp.hr *(kg/kW.h)*	Temp.°F*(°C)* cool-ing med	Air dry bulb	Barom. inch Hg *(kPa)*
					5th Gear					
213.21 *(158.99)*	27926 *(124.22)*	2.87 *(4.61)*	2152	13.9	0.466 *(0.283)*	15.10 *(2.97)*	0.011 *(0.007)*	191 *(88)*	48 *(9)*	28.98 *(98.14)*
					6th Gear					
240.34 *(179.22)*	26721 *(118.86)*	3.38 *(5.43)*	2100	9.8	0.436 *(0.265)*	16.15 *(3.18)*	0.012 *(0.007)*	192 *(89)*	51 *(11)*	28.97 *(98.10)*
					7th Gear					
264.78 *(197.44)*	26077 *(116.00)*	3.81 *(6.13)*	2017	8.7	0.419 *(0.255)*	16.77 *(3.30)*	0.011 *(0.007)*	197 *(92)*	52 *(11)*	28.97 *(98.10)*
					8th Gear					
280.11 *(208.87)*	24187 *(107.59)*	4.35 *(6.99)*	1956	7.0	0.407 *(0.247)*	17.30 *(3.41)*	0.011 *(0.006)*	202 *(94)*	53 *(12)*	28.97 *(98.10)*
					9th Gear					
286.42 *(213.58)*	21660 *(96.35)*	4.96 *(7.98)*	1900	5.3	0.401 *(0.244)*	17.57 *(3.46)*	0.010 *(0.006)*	205 *(96)*	44 *(6)*	28.79 *(97.49)*
					10th Gear					
290.12 *(216.34)*	18822 *(83.72)*	5.78 *(9.30)*	1900	4.3	0.395 *(0.240)*	17.83 *(3.51)*	0.010 *(0.006)*	208 *(98)*	46 *(8)*	28.81 *(97.56)*
					11th Gear					
288.87 *(215.41)*	16001 *(71.17)*	6.77 *(10.90)*	1900	3.4	0.396 *(0.241)*	17.75 *(3.50)*	0.010 *(0.006)*	203 *(95)*	48 *(9)*	28.82 *(97.60)*
					12th Gear					
288.76 *(215.33)*	13799 *(61.38)*	7.85 *(12.63)*	1901	3.0	0.396 *(0.241)*	17.76 *(3.50)*	0.010 *0.006)*	214 *(101)*	49 *(9)*	28.83 *(97.63)*
					13th Gear					
287.60 *(214.46)*	11609 *(51.64)*	9.29 *(14.95)*	1900	2.5	0.398 *(0.242)*	17.68 *(3.48)*	0.011 *0.007)*	214 *(101)*	50 *(10)*	28.83 *(97.63)*

HYDRAULIC PERFORMANCE

CATEGORY: IVN
Quick Attach: Yes
OECD Static test

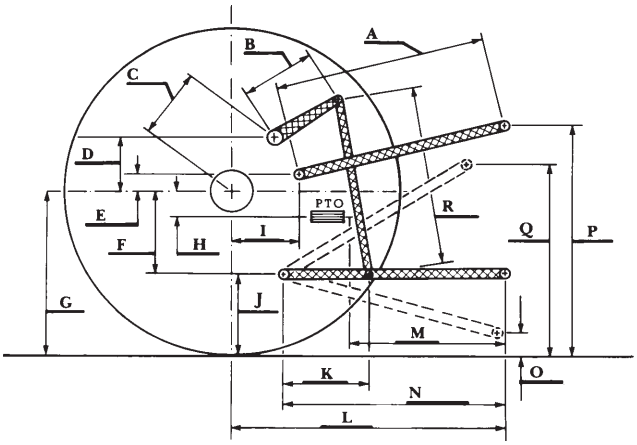
		Lift cylinders
Maximum force exerted through whole range:	20254 lbs *(90.1 kN)*	2x115 mm
	15229 lbs *(67.7 kN)*	2x100 mm

	85 cc pump	85 cc and 35cc pumps combined
i) Sustained pressure at compensator cutoff:	2919 psi *(201 bar)*	2941 psi *(203 bar)*
	three outlet sets combined	
ii) Pump delivery rate at minimum pressure and rated engine speed:	60.7 GPM *(229.6 l/min)*	84.2 GPM *(318.7 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	60.9 GPM *(230.4 l/min)*	80.0 GPM *(302.9 l/min)*
Delivery pressure:	2490 psi *(172 bar)*	2114 psi *(146 bar)*
Power:	88.4 HP *(65.9 kW)*	98.7 HP *(73.6 kW)*
	single outlet set	
	1/2" couplers	3/4" couplers
ii) Pump delivery rate at minimum pressure and rated engine speed:	37.7 GPM *(142.7 l/min)*	42.9 GPM *(162.5 l/min)*
iii) Pump delivery rate at maximum hydraulic power:	36.0 GPM *(136.3 l/min)*	41.5 GPM *(157.2 l/min)*
Delivery pressure:	2287 psi *(158 bar)*	2301 psi *(159 bar)*
Power:	48.0 HP *(35.8 kW)*	55.8 HP *(41.6 kW)*

HITCH DIMENSIONS AS TESTED—NO LOAD

	inch	*mm*
A	28.5	*725*
B	20.5	*520*
C	20.9	*532*
D	18.9	*480*
E	12.0	*304*
F	14.4	*365*
G	38.2	*970*
H	9.1	*230*
I	23.6	*599*
J	23.8	*605*
K	28.7	*730*
L	52.8	*1340*
*L'	58.7	*1490*
M	25.9	*657*
N	40.1	*1019*
O	9.1	*230*
P	50.1	*1272*
Q	41.5	*1055*
R	45.7	*1160*

*L' to Quick Attach ends



JOHN DEERE 8320R DIESEL

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